Museum; and the present writer, who is secretary of the Board.

The Dominion and Provincial Governments have been active in the establishment of animal parks for the protection of game and non-game mammals and birds, and many thousands of square miles of territory have now been reserved as animal refuges, where hunting is absolutely prohibited.

The successful effort of the Canadian Government in preventing the extermination of the American bison, or buffalo, is noteworthy. The original herd of 750 buffalo that the Government purchased in the United States in 1907 and placed in a special enclosed buffalo park of 168 square miles at Wainwright, Alberta, has now increased to more than 2400, and altogether above 3000 buffalo are now under Government protection, including the wild herd of about 500 head in the Peace River region south-west of Great Slave Lake. With the view of ascertaining the possibilities of the buffalo in relation to agriculture, the Canadian Department of Agriculture is now carrying on experiments in crossing the buffalo with domestic cattle, as the cross-bred animals, like the buffalo, are so admirably suited to withstand the most rigorous conditions of a northern environment and produce excellent beef and superior robes.

A report published by the Commission of Conservation on the fishes, birds, and game of Canada last year gives an excellent account of the manner in which these problems are being dealt with in Canada. Constituting as Canada does the last stronghold of the big-game animals of the North American continent, it is hoped and believed that we shall be successful in preventing the reduction to the point of extermination of the many forms of wild life of interest and importance alike to the settler, the sportsman, and the zoologist.

C. GORDON HEWITT.

PROF. JOSEPH RIBAN.

PROF. JOSEPH RIBAN, honorary professor of the Faculty of Sciences of Paris, who has just died at the ripe age of eighty, was one of a type of French chemists which is fast disappearing. Born at Montpellier, he was originally destined for a career in medicine, but under the influence of Balard, the discoverer of bromine, he was led to interest himself in problems connected with pharmacological chemistry, and took up the study of the toxic principle of redoul (*Coriaria myrtifolia*), which he found to be a glucoside and named coriamyrtine. His work on the physiological, chemical, and physical properties of the new substance occupied him during the greater part of 1864, and the results appeared in a couple of memoirs which were published in the *Journal de Pharmacie* and in the Bulletins of the Chemical Society of Paris. Although he continued to follow medicine, Riban was more and more attracted to chemistry, and his nomination as professor of chemistry and technology at the Ecole Normale of Cluny eventually settled his career. In 1869 he joined his old master Balard at Paris as *préparateur* of his course at the Collège de France.

The Franco-German War interrupted his chemical studies, and during the siege of Paris he was a zealous collaborator of Alphonse Guérin at the military hospital in the Rue des Récollets. On the termination of hostilities he was able to resume his chemical work, and a number of papers appeared in rapid succession, on the products of the condensation of valeric aldehyde, and on aldehydes condensed by the elimination of water, known as *aldanes*, on the terpenes and their chlorohydrates, on terebene, and on camphene. Riban's investigations in what is confessedly one of the most intricate and difficult fields of organic chemistry attracted considerable attention at the time of their publication. They gained for him his degree of doctor of physical sciences, and eventually, in 1875, the Jecker prize. The first samples of synthetic camphor arising out of these researches were shown in the Exhibition of 1878.

Riban now became associated with Berthelot at the Collège de France, and was transferred to the Sorbonne, where he became assistant-professor of quantitative chemical analysis. He practically abandoned inquiry in organic chemistry, devoting himself more particularly to general problems of applied chemistry, especially to questions of hygiene. In addition to his work as director of the analytical laboratories at the Sorbonne, he lectured at the Ecole des Beaux-Arts, and was named a member of the Conseil d'Hygiène. These various public duties left Riban little time for original research, but he published a number of notes and minor communications on compounds of phosphine and on the decomposition of metallic formates and acetates in presence of water, as well as some papers relating to eudiometry and analytical chemistry. He was an active contributor to the "Encyclopédie Chimique" and to the "Dictionnaire de Chimie," and in 1899 published a treatise on electrochemical analysis which enjoyed a considerable reputation.

Riban became a vice-president of the French Chemical Society in 1898, and a vice-president of the Conseil d'Hygiène in 1899. He was a careful, conscientious teacher, distinguished for the clarity and simplicity of his exposition, and a painstaking and accurate experimentalist whose work rests upon a solid and durable foundation.

NOTES.

THE valuable article on rhubarb which appears elsewhere in the present issue was prepared for the *Kew Bulletin*, the publication of which has been suspended on the ground of shortage of paper. When we see the waste of paper used in Parliamentary Reports, National Service propaganda, and by Government departments generally, and place this by the side of the amount required for the continued publication of such a periodical as the *Kew Bulletin*—Imperial in its scope and influence—we begin to despair that our State officials will ever possess true standards of value in matters pertaining to science. The subject is dealt with in an article on another page; and all we wish to say here is that we are glad to accord the hospitality of our columns to a contribution intended for the *Kew Bulletin,* and that we earnestly hope action will be taken to secure the continuance of a publication which is more essential now than ever it was. So many misleading statements have recently been made about rhubarb that such an accurate account of the plant as is given in the present article, if made widely known to the public, should save much suffering and needless loss of life.

We notice with much regret the announcement of the death on May 18, at seventy-eight years of age, of Sir Alexander R. Binnie, past president of the Institution of Civil Engineers, and from 1890 to 1902 chief engineer to the London County Council.

The late Lord Justice Stirling's herbarium, consisting chiefly of about 6000 varieties of mosses and liverworts from many parts of the world, has been presented by Lady Stirling to the Tunbridge Wells Natural History Society.

The Canadian Government has recently appointed Dr. C. Gordon Hewitt to be consulting zoologist, in addition to his duties as Dominion entomologist and chief of the entomological branch of the Department of Agriculture. The duties of the office will be to advise in matters relating to the protection of birds and mammals and the treatment of noxious species.

The death is announced, in his eighty-fifth year, of Dr. Ephraim Cutter, a distinguished American microscopist and inventor of many surgical and gynæcological instruments. He was a pioneer in American laryngology, and had studied the morphology of raw beef since 1854. In 1894 he discovered the tuberculosis cattle test. He was an expert in food values, and was the author of more than 800 contributions to the literature of medical science.

An association having the title, Society of Industrial Chemistry, has recently been formed in France. The honorary president of the new society is Prof. Haller, of the Institute, and its object is the development of the chemical industry in France in order that it may be given that prominence which will be necessary in the after-war struggle. The society comprises manufacturers, engineers, and chemists. The headquarters of the society are at 49 rue des Mathurins, Paris.

The Franklin medal of the Franklin Institute, Philadelphia, has been awarded to Dr. H. A. Lorentz, For Mem.R.S., president, Royal Academy of Sciences, Amsterdam, and professor of mathematical physics, University of Leyden. The Franklin medal has also been awarded to Admiral D. W. Taylor, Chief Constructor, Chief of Bureau of Construction and Repair, United States Navy. The medals were presented on May 16, when an address was given on "The Science of Naval Architecture" by Admiral Taylor.

At the annual meeting of the Royal Geographical Society on Monday the medal awarded to Mr. G. G. Chisholm by the American Geographical Society was presented to him by Mr. Page, the United States Ambassador. The Royal medals and other awards announced in Nature of March 22 were presented by the president, Mr. Douglas W. Freshfield. The president referred to work being done by geographers in different parts of the war area, and he remarked:—"In a hero of the recent sea-fight against odds off Dover—a fight that recalls the glorious traditions of the days of Queen Elizabeth—we are proud to recognise an Antarctic explorer, the second in command of Capt. Scott's last expedition, Capt. Evans. It is the same energy and spirit that lead men to face the Antarctic blizzard or the foe that walks in darkness off our own coasts." Sir Thomas H. Holdich has been elected president of the society in succession to Mr. Freshfield.

We learn with deep regret that 2nd Lieut. H. E. O. M. Dixon, Seaforth Highlanders, has died of wounds in France. The son of the Rev. J. Murray Dixon, of Smithland Rectory, Loughborough, he was born in 1885. His ambition, which showed itself when he was quite young, was to excel as an artist, and birds formed the favourite theme for his pencil. Though he modelled his work largely on that of Archibald Thorburn, for whom he entertained an immense admiration, he showed promise of developing a style of his own. He was especially keen on game-birds, but wildfowl of all kinds fascinated him, and he was never so happy as when tramping the hills of Scotland after grouse and deer. His many friends will read with pride the comments of his Colonel: "He was a brave and cool leader of men." He fell on April 9, when rallying his men for the attack on the German second line of trenches, shot down by machine-gun fire, to die of his wounds on the following day. By his death ornithology has lost a devoted disciple, but his work and his memory will ever be cherished among us.

The appointment is announced of a Civil Aerial Transport Committee, to inquire into civil aerial communications after the war; the committee is constituted as follows:—Lord Northcliffe (chairman), Major Baird (deputy-chairman), the Duke of Atholl, Lord Montagu, Lord Sydenham, Mr. Balfour Browne, Mr. A. E. Berriman, Mr. G. B. Cockburn, Mr. G. Holt-Thomas, Mr. Claude Johnson, Mr. Joynson-Hicks, Mr. F. W. Lanchester, Lieut.-Col. M. O'Gorman, Major-Gen. Ruck, Mr. J. S. Siddeley, Mr. T. Sopwith, Mr. H. G. Wells, Mr. H. White-Smith, Mr. W. Tyson Wilson, Sir Laurence Guillemard, Col. J. W. Pringle, the Earl of Drogheda, Mr. G. E. A. Grindle, Mr. G. E. P. Murray, Sir Thomas Mackenzie, the Rt. Hon. W. P. Schreiner, and Capt. Vyvyan. Brig.-Gen. Brancker will represent the R.F.C. The Meteorological Office has also been asked to name a representative, and one or two additional names will be announced later. Mr. D. O. Malcolm will be the secretary of the committee, and the offices will be at Winchester House, St. James's Square.

As already announced, the annual cong ess of the South-Eastern Union of Scientific Societies is to be held this year in London, in the lecture hall and rooms of the Linnean Society, on June 6–9. Dr. William Martin, formerly general secretary of the union, is the president for the year, and will take for the subject of his address on June 6 "The Application of Scientific Method." Among the many interesting items in the programme of the congress, the following papers and addresses may be mentioned. On June 7 Dr. A. Smith Woodward, "Vertebrate Remains from London Excavations," and Mr. E. A. Martin, "Some Skulls and Jaws of Ancient Man, and his Implements." On June 7, too, members of the congress are invited to the Hooker lecture of the Linnean Society by Prof F. O. Bower. On June 8 Prof. E. W. MacBride, "Are Acquired Characters Inherited?"; Dr. G. A. Boulenger, "Reptiles in Captivity"; and Dr. B. Daydon Jackson, "Notable Trees and Old Gardens of London." On June 9 Dr. J. S. Haldane, "Abnormal Atmospheres and Means of Combating Them," and Prof G. S. Boulger, at the Chelsea Physic Garden, "The Associations of the Garden with the History of Botany." During the meeting there will be several visits to places of scientific interest. All subscriptions must be sent direct to the hon. general secretary, Mr. H. Norman Gray, 334 Commercial Road, London, E.1.

WE regret to record the death of Mr. Benjamin Hall Blyth on May 13, in his sixty-eighth year. An account of his career appears in *Engineering* for May 18, from which we take the following particulars. Mr. Blyth served his pupilage to civil engineering with Messrs. B. and E. Blyth in Edinburgh, and in 1871 became a member of the firm of Messrs. Blyth and Cunningham. The work undertaken by this firm grew very rapidly—between 1871 and 1877 Parliamentary plans for work estimated to cost 6,000,000*l*. passed through its hands. Mr. Blyth joined the Institution of Civil Engineers in 1877, became a member of the council in 1900, and was elected president in 1914. He was consulting engineer to the Caledonian, the North British, and the Great North of Scotland Railways. He was responsible for the two great stations, the Central in Glasgow and the Waverley in Edinburgh. Mr. Blyth was also engaged in dock enlargement and improvement at Grangemouth and at Methil; both these docks are fully equipped with the latest appliances for handling material. He was called upon to advise the leading corporations in Scotland, and was much in demand as an expert witness, both in Scotland and at Westminster. He contested East Lothian unsuccessfully three times. He was chairman of the Edinburgh and District Tramways Company, director of the National Bank of Scotland and of the Edinburgh Life Insurance Company, and governor of the Merchiston Castle Schools and of the Royal Hospital for Sick Children. He is survived by an only daughter.

BOTANICAL science has suffered a serious loss through the death of Ruth Holden, an American botanist of great promise. Miss Holden was born at Attleborough, Massachusetts, in 1890, and graduated M.A. of Harvard in 1912. She took up palæobotanical research under Prof. Jeffrey, of Harvard, and in 1913 came to this country as a travelling Harvard fellow in order to devote herself more particularly to the anatomical investigation of Mesozoic Conifers. She became a post-graduate student of Newnham College, and was afterwards elected to a fellowship. Impelled by her love of strenuous work and by her strong conviction of the justice of the cause of the Allies, Miss Holden temporarily relinquished her scientific career at the Cambridge Botany School and threw herself with characteristic energy into nursing. In December last she went to Russia with the first of the Millicent Fawcett medical units, and earned the unstinted praise of the administrator of the unit by her self-sacrificing work in Petrograd, Kazan, Galicia, and in various parts of Russia. After partially recovering from an attack of typhoid fever, she died from meningitis at Moscow on April 21. Miss Holden had published several papers on palæobotany, both in America and England, and shortly before her departure for Russia she completed an account of a new Cordaitalean genus from India. She was an exceptionally keen and able investigator, who endeared herself to all with whom she was associated by her outspoken candour, her sense of humour, and her wonderful power of overcoming difficulties, both in the way of fulfilment of her plans of scientific work and in surmounting obstacles which confronted her in her endeavours to obtain employment as an American citizen with a British medical unit.

MR. J. V. DUPRÉ, whose death we regret to record, had a distinguished scientific career, and did much valuable work in connection with explosives. After leaving Merchant Taylors School, he took the three years' course in engineering at the City and Guilds of London Technical College, South Kensington, and gained the college diploma. After leaving college he worked for about a year in the laboratory of the late Dr. A. Dupré, F.R.S., where he gained his first experience of explosive work, in which he evinced the greatest interest. He then obtained an entrance into Messrs. Vickers, Ltd., and went through their shops at Erith, afterwards working for six years in their drawing office at Westminster. During the whole of this time he lived with his brothers, then chemical advisers to the Explosives Department of the Home Office, having succeeded their father in this position, and thus kept in closest touch with explosive chemistry, practical and applied. He then went to Canada, where he worked as chemical assistant to Dr. Lynde, of the McGill University, at St. Anne's. Soon after the outbreak of war he obtained an appointment in connection with the Explosives Department of the Munitions Board, Canada, and superintended the erection and working of a number of explosives factories in various parts of Canada. In all this work he showed such a grasp of his subject that in October, 1916, he was appointed chief chemical adviser, and finally technical adviser also, posts he filled with the greatest success. During January of this year he had a serious breakdown owing to overwork, and on convalescence was sent by the board to Old Point, Comfort, Virginia, to recuperate, but caught a chill on the journey, which developed into rheumatic fever, and finally into pneumonia, which ended fatally on March 13.

FEW men were so well known in pharmaceutical circles, and few so highly respected, as Mr. Peter MacEwan, who died on May 16, in his sixty-first year, and for the past eighteen years had held the responsible post of editor of the *Chemist and Druggist*. Mr. MacEwan received his pharmaceutical training in Scotland, and evinced very early in his career a distinct inclination towards the scientific side of pharmacy. When only twenty-six years of age he was appointed secretary in Scotland of the Pharmaceutical Society, and in that capacity found time and scope for the development of his scientific tendencies and ability for organisation. After a comparatively short time he joined the editorial staff of the *Chemist and Druggist* in London, succeeding the late Mr. A. C. Wootton in 1899. He published numerous papers dealing chiefly with the chemical aspect of pharmaceutical problems, and also devoted much attention to pharmaceutical politics. His judgment was keen and accurate, and his criticisms of the prevailing policy were frequently advanced with remarkable vigour. There was scarcely a branch of pharmacy in which he did not possess some special knowledge, and, being one of the kindliest and most generous of men, an appeal to him for assistance in any subject was seldom made in vain. He was a constant attendant at pharmaceutical meetings, and his contributions to the discussions almost invariably threw new light on the subject under consideration. His health had been for some time indifferent, but his death, which was due to apoplexy, was sudden. The funeral, which took place on Saturday last at Marylebone Cemetery, Finchley, was attended by many well-known pharmacists, including the president and registrar of the Pharmaceutical Society, and also by representatives of other learned societies. By his death pharmacy has sustained a distinct loss, and his absence from pharmaceutical gatherings will be painfully felt.

WE are indebted to the *Lancet* for the following extracts from an obituary notice of Prof. Landouzy, whose death, on May 10, after a long illness, we announced last week. Louis T. J. Landouzy was born at Rheims in 1845, the son and grandson of medical men. Beginning his studies in the place of his birth, he went to Paris in 1867 to complete them, becoming hospital resident in 1870, and steadily ascending the professional ladder until his appointment as physician to the Hospital Laennec in 1890. Three years after this he accepted the chair of therapeutics at the faculty of medicine in Paris, bringing with it the membership of the Academy of Medicine. In 1907 he was chosen by the faculty to be its dean, and in 1912 he was elected a member of the Institute. His most recent honour was the award of a gold medal for his work on infectious diseases by the Ministry of the Interior. Landouzy had long become one of the familiar figures of contemporary medicine both in France and abroad. Endowed with a great capacity for work, associated with remarkable physical activity, he accomplished a very large amount of scientific work bearing on a variety of important questions. But it is in connection with tuberculosis that his name will be best remembered. In the struggle against tuberculosis as a social disease Landouzy was ever to the front. He was delegate to the several international congresses on tuberculosis, and at Washington in 1908 expressed the belief that the centenary of Pasteur would witness the final extinction of tuberculosis. If he had lived to complete it, his last work would have been devoted to the organisation of an anti-tuberculosis campaign in the Army and to the invaliding of the tuberculous soldier. He was present in London at the last International Medical Congress of 1913, when he read a paper on thermal treatment and spoke as the official delegate at the dinner given by Lord Beauchamp on behalf of the British Government.

DURING the winter months, as Mr. Miller Christy has stated in a recent paper (Quart. Journ. Roy. Meteor. Soc., vol. xlii., 1916, pp. 269, 275), the sound of gun-firing in Flanders and France is rarely heard in the south-east of England. The conditions are now becoming favourable to audibility. According to a correspondent of the *Times* (May 14), the air-waves resulting from the heavy bombardment of Zeebrugge on the morning of May 12 were heard and felt to an unusual degree at Dover, Deal, and other places on the south-east coast. Dover lies eighty miles to the west of Zeebrugge, and there was a light north-easterly wind at the time. Yet "residents in villages several miles inland were awakened by the noise, the houses on the higher ground especially feeling the vibration." We have also received an interesting letter from Dr. H. C. L. Morris, of Bognor, in which he states that the sound of distant gun-firing was heard at that place, while he was out of doors, from 11 to 11.30 p.m. on May 13. He describes the sound as "a continuous rapid vibratory percussion, coming up from the south-east. . . . The sounds varied in intensity, and as near as I could judge a hundred distinct reports were heard to the minute. There was a very light land breeze from the north-west at the time." The sound-waves evidently came from a very distant source, possibly from the neighbourhood of Arras, which is 160 miles from Bognor.

ON April 2, 1916, shortly after 2 p.m., a great explosion occurred in a munition factory at Faversham. Several references are made to this explosion in the descriptions of the East London explosion of January 19. The observations are all from places to the north of Faversham. The sound of the explosion was heard at Maldon (30 miles), Dunmow (45 miles), and Little Bardfield, near Braintree (49 miles)—all places in the silent zone of the East London explosion; also at Diss (75 miles) and Norwich (92 miles). The air-waves shook windows at Little Bardfield, Felsham (60 miles) and Elmswell (64 miles) near Bury St. Edmunds, and Newmarket (68 miles)—in the silent zone of the East London explosion; also at Ufford, near Woodbridge (60 miles), Diss, Wreningham (88 miles) and Haddiscoe (89 miles) near Norwich, Norwich, and near Aylsham (104 miles) There is no evidence of a silent zone in this explosion, but the number of observations summarised above is, of course, too small either to prove or to disprove its existence.

IT appears from the annual report of the Decimal Association for 1916, which has just been received, that considerable progress was made during the year in the movement for the decimalisation of the coinage and weights and measures. Numerous representative public bodies have passed resolutions in favour of the proposals; as, for example, the executive council of the County Councils Association, which has expressed the view that it is desirable in the interests of education, commerce, manufactures, and trade that the decimal system of coinage and weights and measures should be as speedily as possible brought into general use in the United Kingdom, and that the system should be introduced into the curricula of the various schools as a necessary part of arithmetic. In this connection it may be mentioned that the Incorporated Association of Headmasters has also invited its members to support the proposals, and that the Lancashire and Cheshire division of that body has formed a committee for the purpose of suggesting ways of discovering and overcoming existing objections to the introduction of the metric system. British consuls abroad have continually directed attention to the necessity of adopting the metric system, and to the loss of orders and contracts involved in the retention of our present weights and measures. The recommendations of the Dominions Royal Commission were very sympathetic as regards the metric system of weights and measures and decimal coinage. The Commission was of opinion that the termination of the war would bring with it an unequalled opportunity for securing this much-needed reform, and that the Imperial and Colonial Governments should then co-operate to establish throughout the Empire a uniform coinage based on the decimal system and uniform weights and measures based on the metric system.

THE Philadelphia Museum has recently acquired a collection of specimens of the arts and crafts of the Bagobo, a people inhabiting the mountains of Mandanao, between the crest of the range which culminates in the volcanic Mount Apo, the highest peak in the Philippines, and the waters at the western side of the head of the Gulf of Davao. This is described by Mr. R. W. Hall in the *Museum Journal*, vol. vii., No. 3, for September, 1916. In December, when Orion appears in the sky, there is a magical ceremony intended to promote the growth of rice, their staple food. Though the fact has been questioned, there seems little doubt that at this sowing rite a slave victim was bound and his body hacked in pieces by the celebrants. It does not appear that, as in the Khond rite described by Sir J. Frazer, the flesh was actually buried in the fields. But this was possibly part of the rite in its primitive form.

IN the *Indian Journal for Medical Research* for January (vol. iv., No. 3) Capt. Knowles and Capt. Cole publish a study of the entamœbic cysts of intestinal amœbæ of man. They point out that divergent views exist as to (*a*) the differentiation of species of intestinal amœbæ, (*b*) the pathogenicity of the different species, and (*c*) the differentiation of species when encysted. They state their principal conclusions as follows: *Entamoeba ietragena* is usually regarded as identical with *E. histolytica*, and our results confirm this view. *E. minuta* is usually regarded as the pre-cyst of *E. histolytica*, whereas we have found *minuta* forms associated with both *E. coli* and *E. histolytica*. Where the prevalent type of organism was *E. minuta* it was commonly in association with 8-nucleate cysts, and resembled *E. coli*. We believe that these "different species" are all one and the same organism. The paper is illustrated with two excellent coloured plates.

THE method of measuring a small electric current, as, for example, the ionisation current through a gas, by the rate of leak of the charge on an electrometer through a known high resistance, has proved so convenient that many experimenters will welcome a paper by Dr. W. F. G. Swann and Mr. S. J. Mauchly on a method of constructing a high resistance of the Bronson type, for which Ohm's law is applicable, which appears in the March number of *Terrestrial Magnetism and Atmospheric Electricity*. A small quantity of ionium, which was chosen as the most suitable radio-active material, is placed in a shallow depression in the upper face of a brass plate and covered with sheets of mica and silver foil. The plate rests on the bottom of the ionisation chamber, through the top of which an insulated tube carrying a circular electrode projects. Through this tube a rod passes which carries a smaller plate, and the distances of both plates above the ionium plate can be varied. The metal surfaces within the chamber are all silver-plated. When the upper plate is 4·6 cm. and the lower 1 cm. above the ionium plate, the resistance of the cell is constant up to a potential difference of 4 volts, owing to the usual decrease of conductivity being compensated by the action of the δ rays from the metal surfaces.

IN the adoption of any scheme which runs counter to habits and prejudices, and with which obvious advantages and disadvantages are connected, as in the substitution of "Summer Time" for the normal and uniform method of time reckoning, many suggestions will be made with the view of improving the mechanism and diminishing the inconveniences. M. Désortiaux, of Tulle, a retired French engineer, is early in the field with a pamphlet, "La Réforme rationnelle de l'heure" (Gauthier, Villars), urging some drastic proposals that seem calculated to make confusion worse confounded. He objects to the abrupt alteration of the clock-hands twice a year, involving sudden interruptions of time-reckoning, and recommends a number of small alterations, the maximum being seven minutes, which he thinks could be introduced imperceptibly and without dislocation of our habits, by arrangement with the railways and other public indicators of time. In each week of January the clock is to be advanced five minutes. On two days of each week in February, April, and May the clock will be accelerated six minutes, and in March seven minutes. In June there will be no alteration, and in the second half of the year there will be retardations of similar amount, to restore the clock time to normal condition in January. The alteration effected by these small increments is far more considerable than in the plan that has obtained legislative sanction. The accumulative effect at maximum is 3·57 hours, one object of the ingenious proposer being to make the watch indicate approximately the same hour at sunrise. This arrangement discloses one weakness of the plan. It takes no account of latitude, and though the author admits the necessity of agreement between countries that have conterminous borders, he does not consider that the inhabitants on the Belgian border would be differently affected from those on the Italian. Again, it is strange that one who clearly perceives the annoyance caused by the sudden change of an hour, with its tendency to disarrange transport services, can suppose that a long-suffering public would endure a series of irritating interruptions twice a week for many months of the year. But having sanctioned a tampering with the uniform record of time, many utterly impracticable methods will be proposed with the benevolent intention of reducing the inconvenience to a minimum.

IN the April issue of the *Quarterly Review* will be found a well-informed article by Prof. W. J. Ashley on German iron and steel treated from the point of view of its commercial as distinct from its technical development. The syndication movement in Germany began to achieve continuous and substantial success when in 1892 the pig-iron producers came together, and in 1893 the Westphalian Coal Syndicate was formed. This example was followed by various branches of the steel trade. These combinations began with a mere price agreement; then they had to apportion the sale; and afterwards they concentrated the marketing of their commodity in a common selling organisation. Prof. Ashley then traces the further development of these "cartels" and their amalgamation into the "Stahlwerksverband," the great Steel Syndicate, which has commanded the whole position ever since. In order effectively to regulate price it limits each of the constituent concerns to a prescribed quota of a defined total output and concentrates all the sales in a central office. The growing cost of plant makes it very difficult for new competitors to start up from outside. In Germany the experts consider that no new steel works can profitably be put down which have an output capacity of less than 400,000 tons. Finally, the system of bounties payable to home manufacturers in respect of their export trade is explained.

THE formation of "ground ice," or "anchor ice," at the bottom of running streams occurs sometimes in this country, and forms the subject of an article in *Engineering* for May 11, by Mr. J. MacAlister, assistant engineer at the Greenock Waterworks. Ground ice has been experienced at Greenock in the "Cut," an open aqueduct some five miles long and situated about 500 ft. above sea-level. The water has a velocity of about 3 ft. per second, and ice sometimes forms at the bottom, thereby raising the surface-level of the water. Careful watching is required, as the slabs of ice sometimes take up such positions during the process of release as lead to overflow of the water. Despite other theories Mr. MacAlister is inclined to think that the formation of ground ice in this channel, which has a rough bottom, is due to the cooling of the whole mass of water and the ice first forming in the comparatively still water encountered in the lee of stones, etc. The process may be, and probably is, accelerated by radiation, as the portions of the aqueduct where the ice usually forms first are situated at comparatively open spaces, and have low banks. Towards the end of January this year, for the first time in the history of some of the reservoirs, the formation of ground ice was general throughout the Greenock Waterworks. The author describes the various measures taken to remove the consequent ice blockages.